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Phenomenal Deformations:

Affordance as a Design Tool to Deal with Subject-Object Complementarity in Architecture

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ABSTRACT

The production of knowledge related to the architectural project during the design phase mainly concerns the object in itself, while its relationship with occupants is an underrated factor for design success. This is due to the fact that architecture as a formal design field is naturally devoted to deal with the physical and geometric characteristics of the design object identified in unequivocal ways, while occupancy implies a degree of subjectivity and contingency which phenomenally deforms the object into its many manifestations.

This paper analyses the concept of affordance by Gibson (1979) as a suitable tool to deal with occupancy in terms of subject-object complementarity because it addresses the ecological value of an object, i.e. its value in relation to a perceiving subject and not in itself. The first problems posed by the concept of affordance, hence, is how the subject can be identified given the variety of real occupants which interact with a certain environment. The common answer is to address only those aspects which are in common between all the subjects, i.e. the ones who define occupants as members of a species. At this level, indeed, occupants are natural subjects, which can only express basic needs to be met by sensorimotor activities, and for this reason a different approach considering the subject as culturally and also individually defined is needed in order to shift from an automatism of inhabitation to the self-determination of occupancy. Affordance must therefore be considered in a broader context going beyond sensorimotor activities and dealing also with upper cognitive faculties. However, an affordance related to a culturally-defined subject does not entail self-determination per se, since also cultural and individual schemes can be absorbed without the exercise of critique due to habituation. Activities driven by natural, cultural or individual schemes differ with regard to the interval they entail between the action received by the environment and subject's reaction. Indeed, more individuality is implied, longer the time needed to process data received from the environment. Time is here intended not as an extensive but as an intensive dimension. This means that it cannot be considered as a sum of instants, but an unitary event having a specific character. This is the concept of duration in Bergson, as opposed to spatialized time, and it also recalls Bakhtin's idea of chronotope.

In the overall framework interweaving design activity and time through cognition, chronotopes can be useful in the definition of an affordance-based architectural approach. Indeed some chronotopes describing duration in its becoming are related to the contingent and direct relationship between the subject and his object which is expressed by the concept of affordance.

The present paper aims at understanding how these contributions from cognitive sciences, literature, philosophy and semiotics can allow architects to improve affordance as a design tool starting from a review of the state of the art. At the end, some case studies from the past which address the question of a self-determined occupancy are proposed as exemplary of an affordance-based approach to architecture.

The identity of occupants: who is the subject of the subject-object duality?

The interest of affordance in the architectural field resides in its ability to grasp the project in complementary terms with regard to the occupant. It therefore raises a question concerning the identity of the occupant who must be defined in order to define the project in its turn. This identity is very generic, due to the fact that affordance mainly concerns sensorimotor activities which engage the occupant as a representative of mankind, i.e. a plain natural subject which is not culturally or individually defined. Culture and individuality rather partake different kinds of activities, notably the higher cognitive ones drawing upon customs and personal experience respectively. There is no preferential dimension of subjectivity to be considered during the design process, because the occupant is a natural, cultural and individual subject at the same time, even if he expresses these subjectivities one at a time, depending on the specific situation he is dealing with. Each situation, indeed, confronts the occupant with a particular need to be fulfilled by executing the correct activity. Both needs and activities can be ordered into a scale in relation with the increasing level of subject's cognitive engagement. This paper draws upon two existing models to accomplish this task. These models have been reviewed by scholars since their first appearance in order to make them more flexible to particular cases, but they are here presented in their original version because their supposed rigidity achieves a clarity which is lost in its following formulations, and which is useful to recover for the purposes of this paper. As far as the scale of needs is concerned, the model is the Maslow's hierarchy (1943), while with regard to activities the model is Piaget's stages of cognitive development (1972). Both models are based on a teleological perspective which progresses from the lower to the upper steps of the scale. Actually, this finalist progression must be updated in so far as the scale is not a path to be covered once and for all, but a collection of conditions which are underwent by the subject depending on the situation and determine which dimension of subjectivity he will express. Subjectivity can be defined as the membership of the subject in different groups ordered in relation to their dimension, which indicates the strictness of criteria must be met to be their member, so that in parallel the subject, as member of these different groups, is defined in increasingly individual terms as the membership criteria become stricter and stricter. The levels of individuality depend on the type of schemata the subject adopts to perceive reality. Indeed schemata are strategies of interpretation and abstraction based on codes which can shared among members of groups varying in size. Individuals, as members of humankind, share some natural schemata which are common to all men, while as members of a cultural community or disciplinary practice share other kinds of schemata which apply to smaller and smaller groups as the specificity of membership increases. At the extreme of the scale, the individual is member of a group constituted by one only person: himself. As member of the group composed by himself, he adopts very original schemata, drawing on his personal experience and memory. This last kind of membership allows a very transactive relationship between the subject and his environment, in the sense that a major involvement of his personality is implied. Therefore the levels of transaction increase in inverse proportion with respect to the extension of the group: as individual, the subject's interaction with environment is aware, as member of a cultural community this interaction is customary and as member of humankind it is instinctive. However, the subject does not decide which membership he must express, rather membership, and therefore the adoption of related schemata, is contextual: it depends on the situation. For instance, only in professional contexts the subject expresses his membership to a disciplinary group, and a deconstextualised expression of this membership is defined 'professional deformation', that is an anomalous behaviour. As a general rule, the subject expresses his membership depending on the situation, which in its turn requires from the subject the fulfilment of different kinds of needs, from the physiological and safety ones shared by all men to the higher ones related to self-esteem and self-actualization which are personally interpreted. The subject must perform higher cognitive activities to fulfil higher needs, and therefore higher needs elicit

consciousness. Since the hierarchy of needs seems to parallel personal growth, the membership of the subject could be imagined as a series of stages which are achieved step by step. Indeed, the characteristics of the subject as member of each group recalls the characteristics of the child in the various stages of his cognitive development. However, the Piagetian model of cognitive development can only be used to understand the behaviour of the subject as member of different groups, and must not be adopted in its temporal formulation, because membership, for the purpose of this paper, depends on the context, and not on the age.

Variations upon the concept of affordance: from direct experience to the routinization of perception

If subjectivity is manifold, the suitability of the concept of affordance to deal with its various dimensions must be discussed. Indeed, many researchers proposed to extend the concept of affordance to cultural and individual dimensions of subjectivity, as if the concept was intended by Gibson to deal only with the plain natural subjectivity expressed by the occupant when engaged in sensorimotor activities. Actually, the original interpretation of affordance by Gibson does not restrict the adoption of affordance to sensorimotor activities. Rather, Gibson focuses on that particular kind of affordance which is grasped during sensorimotor activities because his seminal book was not devoted to the study of human being in particular, but of the animal in general. Of course, only the very basic dimension of natural subjectivity is shared among the totality of different animals, and this led Gibson to concentrate mainly on lower cognitive activities. Nevertheless, in some specific chapters which act as digression upon the specific case of human being, Gibson shortly refers to affordances typical of social activities embedded with a cultural content. For instance, he writes about the affordance of the postbox with regard to letter-mailing, by specifying that this affordance is manifest to a letter-writing human in a community with a postal system, that is a case where both the need of the human (letter-writing) and the rules to fulfill it (the postal system) are culturally based.
However, the cultural aspects of affordance, i.e. those dimensions which are enacted by the subject as bearer of a cultural code, were not specifically explored by Gibson and were addressed only years later by Norman (1988). In his book 'The Design of Everyday Things', Norman clearly acknowledges that the perception of affordances also depends on semantic, cultural and logical constraints. This assertion made him oppose the idea that the perception of affordance is immediate, because the aforementioned constraints require cognitive operations upon the data of perception which take time. These operations consist in conferring meaningful unity to a bundle of sensations analytically perceived through channels and subsequently matched to what Norman calls 'prestored templates', i.e. schemata. This is not an innocuous extension of the concept of affordance, but a complete reversal if we consider that Gibson, influenced by Gestalt psychologist Kurt Koffka, supported the idea that unity was not a product, but the starting point of perception, where no channels exist neither elaborations occur, so that it did not need time to be grasped. Nevertheless, the analytical hypothesis by Norman is suddenly reformulated by Norman himself in synthetic terms. Indeed, once schemata gain an increasing role in determining the way the bundle of sensations must be perceived, the analysis of sensations themselves is automatized and perception actually becomes immediate and synthetic also in the case of cultural affordances. Therefore, Normans' conclusion about the adoption of the concept of affordance into architecture and design in general is that the project must comply with schemata in order to be recognized by the occupant and consistently used. In a similar way, Umberto Eco (1997), from the side of semiotics, suggested to architects and designers to exploit existing processes of codification to denote the function of the

object, otherwise it would become something ambiguous, capable of being interpreted in the light of various different codes, so that it becomes suitable to any use imaginable and to none in particular (Eco, 1997, p. 178). Anyway, this position should be updated, as nowadays the globalization of capitalism and the individualization of consumption patterns make language ineffective and architecture as well as industrial design are turning to affect as an uncoded, pre-linguistic, and for this reason universal, form of identity for any subject (Spencer, 2016). The result is that inhabitation is less about doing what some designer or manager explicitly intended in a space and more about imaginative, ad hoc appropriation for unanticipated purposes (Mitchell, 2012, p. 154).
The real interest in the concept of affordance exactly lies in its suitability to move from the logic of recognition expressed by Norman and Eco to the logic of encounter required by present times.

The immediacy of perception and the question of occupants' self-determination

Affordances, no matter if related to natural or cultural dimensions of subjectivity, have in common the immediacy of perception due to the exploitation of natural and cultural schemata respectively. A more conscious, and therefore proactive, engagement of occupants with regard to their environment requires a reduction of these schemata and the fostering of the empirical character of affordances: the immediate and automatic interpretation of the mechanisms of affordance represents an obstacle towards the achievement of this goal. It is worth noting that Bergson (1910) introduced a discussion upon free will at the end of his 'Essay upon the Immediate data of Consciousness'. To Bergson, indeed, it must be noticed 'that we rise by imperceptible stages from automatic to free movements, and that the latter differ from the former principally in introducing an affective sensation between the external action which occasions them and the volitional reaction which ensues.' (Bergson, 1910, p. 33). For the self-determination of the subject, hence, an interval is needed between the received and the returned action, a temporal gap where consciousness prefigures what the automatic reaction would be, and substitutes it with the invention of alternative, voluntary reactions. This temporal gap, to Bergson, is an internal state of the subject he calls duration and he distinguished from the spatialized time of scientific knowledge. Spatialized time is an abstraction which occurs once the event is detected as the difference between a previous and a following state of affairs which become the initial and final instants of a temporal partition operated on the flow of reality which is actually continuous. The partition occurs according to schemata which select the starting and final instants as coincident with states of affairs which are relevant for the subject. But before this operation is performed by consciousness, the subject exactly lives reality as a flow, that means that the extraction of the event is in its becoming and the temporal gap is therefore characterized by blurred edges, as the individual experience surges on with every new piece of information which is brought up by flowing reality (Keunen, 2008). At this point, schemata have not taken place yet, and this is the reason why it represents the moment when the occupant, if allowed by the architect, can redefine his relationship with the environment he lives in, by abandoning the 'prestored templates' by Norman in favor of the constitution of his own templates, depending on his individuality and the contingency of the situation. It is not surprising, then, that many techniques to achieve this goal were defined in the context of research upon imagination, in particular in the artistic field, intended as that faculty of human mind which allows to shift from repetition of existing standards to the invention of new frameworks.

A theoretical framework for the techniques of inventive occupancy

Techniques upon schemata consist in their reformulation rather than suppression, because schemata cannot be simply suppressed. Indeed Karl Popper, from the side of epistemology, posited that perception is either a corroboration or a refutation of a previous hypothesis formulated upon the world: mind is not a passive receiver of sense impressions to be worked upon only in a later moment (Zimmer, 2003). In the 60's Anton Ehrenzweig (1971), in the framework of a theory of creativity, developed a technique with the aim of exercising a purely receptive faculty without the mediation of schemata. He called this technique low-level vision, and it actually was a sort of unfocused glance holding together figure and ground in a way that can be hardly called perception and is not useful for action. The objective of practices upon schemata against the logic of recognition, therefore, is not to suppress them, but to provide the subject with the tools suitable to change them according to the situation, in order to be open to the encounter with the unexpected.
There are two aspects of the relationship between occupant and its environment which can be operated to reassert or question schemata: the amount of new stimuli afforded by the environment, which measures the pace of its transformation, and the state of consciousness of the subject, which can vary between the passivity of reflexes and the proactivity of reasoning. Deleuze (1997) called a strong or weak transformation of external conditions 'saturation' and 'rarification' respectively, while with regard to the internal states of the subjects he talked about 'slowing down' when consciousness draws upon preordained schemata to interpret reality and 'acceleration' in the opposite case, because the different kinds of engagement with the environment distort the perception of time by the subject. These two sets of aspects are interdependent. Indeed the routinization of stimuli afforded by a steady environment ingrains some schemata, but at the same time the schemata produced this way will reduce the attention to new stimuli produced by environmental conditions eventually changing. However, if environment considerably changes, schemata cannot accommodate a large amount of new stimuli and they must be reformulated.
The possible relationships between the variation in the environment and the variation in the occupant are well exemplified by Bakhtin's minor chronotopes. It is worth noting that Bakhtin was interested in the dynamics of imagination in the literary field, and therefore his contribution is consistent with the research upon the inventive role of the occupant in relation to the environment he inhabits. Keunen (2008) explicitly proposes a parallelism between the categories by Deleuze and the chronotopes by Bakhtin. To Keunen "the nature of the information (the amount of new stimuli) on the one hand, and the degree of activity and passivity (the pace of the state of consciousness) on the other hand are, in their mutual combination, responsible for the creation of four poles within which the human experience of time oscillates" (Keunen, 2008, p. 43). These poles can be represented through some chronotopes identified by Bakhtin. The 'chronotope of the provincial town', for instance, exemplifies those cases characterized by steady environmental conditions dealt with in customary ways by the subject. It therefore represents the logic of recognition between the occupant and the project. Instead, the 'chronotope of encounter' and the 'chronotope of the parlor' are both characterized by the fact that they raise an alert attention from the side of the subject, who is encouraged to question his own schemata, but for different reasons. Indeed in the first case the reformulation of schemata is due to the novelty and unexpected character of the situation, while in the second case the situation is not an accident, because the subject deliberately goes to the parlor to attend to an encounter set in advance. Here the alert attention, and the necessity to continuously reconsider his positions, are produced by the interactive and challenging character of the relationship between the subject and a steady environment, rather than by the unexpected transformation of environmental conditions. Then, the 'chronotope of the Gothic castle' is based on the expectation of a situation which does not actually occur, and that in the specific case of the castle is generated by the fear, while in general it takes place when the subject tries to adapt reality to a schemata without success. Finally, the 'chronotope of the threshold' is characterized by a huge

amount of new information which cannot be dealt with by the subject unless he completely disavows his previous experiences and the schemata they produced. However, this break paralyses action, and therefore the subject is unable to react to environmental stimuli.

From theory to practice: approaches from the past

The aforementioned chronotopes seems to suggest some techniques to operate schemata, thus reducing the automatic character of the affordance in favor of its empirical grounding.
The first consideration is that, actually, only the 'chronotope of encounter' and the 'chronotope of the parlor' describe a reformulation of schemata useful for the purposes of the present paper. Indeed the 'chronotope of the provincial town' just describes the ordinary conditions of perception driven by preordained schemata, while the 'chronotope of the Gothic castle' and the 'chronotope of the threshold' concern anomalous relationships between schemata and reality which undermine the correct perception of the situation and the adequacy of consequent action. Therefore, only the 'chronotope of encounter' and the 'chronotope of the parlor' are further analyzed as far as their possible influence on design practices is concerned.
These chronotopes both exploit the technique of defamiliarization, but with different focuses. Defamiliarization was formalized at the beginning of the 20th century by Victor Shklovsky who stated that "the technique of art is to make objects 'unfamiliar,' to make forms difficult, to increase the difficulty and length of perception because the process of perception is an aesthetic end in itself and must be prolonged" (Shklovsky, 1917, p. 277). The aim of Shklovsky was to confer to art a key role in catalysing new forms of awareness with the aim of freeing the individual existence from habituation, in a period characterized by the discussion about the effects of assembly lines upon human cognition. Liberation from habituation required, as predicated by coeval logical empiricism, a return to reality as it is perceived directly rather than as it is known through schemata, in order to derive knowledge individually, on the basis of reasoning. This objective can be achieved in two different ways. The first one focuses on the transformation of the subjective standpoint of observation, so that the conflicting perspectives make the occupant acknowledge the variety of possible schemata and offer the opportunity to make a conscious decision with regard to their adoption. The second way, instead, is more focused on the characteristics of the environment, which could be designed in order to confuse schemata, thus eliciting an alert attention from the side of occupant who must formulate ad hoc interpretations to make sense of the situation. The paper suggests that the latter case recalls the dynamics represented by the 'chronotope of the parlor' because the environment is steady, and the occupant starts a sort of dialogue to better understand it. On the contrary, the former case recalls the dynamics represented by the dynamics of the 'chronotope of encounter' because the environment undergoes disruptive tranformations, from a phenomenological point of view, as the occupant changes perspective, but each time it is clearly perceived.
In relation to the 'chronotope of encounter', techniques of defamiliarization in architecture can be studied through the analysis of Joseph Albers' work. Albers was influenced by logical empiricism due to the lessons of some empiricists at the Bauhaus in Dessau (Diaz, 2008). For instance, he adopted strategies such as mirror writing as a teaching method to train his students in the understanding of form independently of cultural schemata, due to the fact that writing letters from the opposite side made students concentrate on the formal characteristics of the sign and on the procedure to achieve those characteristics, which are instead automatically absorbed and reproduced when the letter is written as usual. In more recent times, a similar technique to perceive environment with new eyes was proposed by Bernard Tschumi (1996), who suggests to explore

spaces through uses which transgress their program, for instance to experience a stairwell through bungee jumping.
In relation to the 'chronotope of the parlor', instead, exemplary practices can be derived from radical movements of the 60's and 70's. Guy Debord, an important representative of the International Situationist, adopted a technique he called 'détournement' which essentially reinterpreted the formalist technique of 'defamiliarization'. The linkage between the International Situationist and architecture is represented by Constant Nieuwenhuys, who experimented what he calls the 'ancient powers of architectural confusion' in his unrealized project New Babylon (Andreotti, 2001). Constant Nieuwenhuys also collaborated with Aldo van Eyck, an architect who has, quite the opposite, lots of built projects. The proximity of Aldo van Eyck and Constant Nieuwenhuys in particular is witnessed by their collaboration for the 'Man and House' exhibition at the Stedelijk Museum in 1953, as well as by van Eyck's article on labyrinthine clarity published on the Situationist Times in 1963 (Sadler, 1999). Labyrinthine clarity can be considered an architectural technique drawing upon occupants' consciousness with the aim of suspending their preordained schemata and allow their reformulation. This couple of contradictory terms refers on one hand to the difficult perception entailed by the labyrinth, as well as the high level of attention it arises. On the other hand, the term 'clarity' indicates that once the occupant is situated in the labyrinth, he can confer to it a meaning which is clear from the subjective standpoint, but absolutely obscure from the exterior (Wellmer, 1991).

Conclusion: back to the emergent character of affordances

The objective of the paper was to understand to what extent the concept of affordance can be adopted in architectural design. Indeed affordance is interesting as far as it implies a different consideration of occupants, whose interaction with environment is proposed as emergent from the anchoring of the subject in the world rather than as preordained in compliance to transcendent norms. Nevertheless, the complementarity between occupants and environment determines a strong influence of the latter on the former, so that the risk that occupants lose their self-determination and are directed from the exterior arises. After all, the description of perception as an immediate process which occurs without channels predicated by Gibson strengthens this idea of the occupant as a passive subject. With the aim of interweaving the emergent character of affordance with an active relationship with environment, the paper starts with a new definition of occupant entailing the manifoldness of his subjectivity which explains how the attitude of the observer with regard to his environment depends on the kind of activity he is carrying out: only those activities which engage the higher cognitive faculties allow a critical attitude by the occupants' side and their active engagement. Once the different kinds of subjectivity had been outlined, the paper further investigated what is the applicability of affordance with their regard. While affordance is usually related to lower cognitive activities due to the interest of Gibson in animals in general, the concept can also be applied to higher tasks which have a cultural content, as illustrated by Norman. However, both kinds of affordance have in common a certain automatism, in the first case due to the elementary character of actions to perform, while in the second case due to the habituation derived from the repetition of norms which can be set in the context of cultural or disciplinary groups. These norms are absorbed by occupants as schemata which filter the relationship with environment, so that the anchoring of the subject in the world is lost and perception becomes recognition. The real interest in the concept of affordance, instead, exactly lies in its suitability to move from the logic of recognition expressed by Norman to the logic of encounter, which allows the occupant to address his own individuality coupled with the contingency of situation. The paper therefore focuses on those techniques which are useful to achieve this goal by reducing the role of

schemata in determining the way environment is perceived. These techniques start by acknowledging that schemata are the product of habituation, and therefore explore strategies to disrupt the routinization of perception, working on both the occupant and the environment. It is not surprising, then, that many techniques to achieve this goal were defined in the context of research upon imagination, in particular in the artistic field, intended as that faculty of human mind which allows to shift from repetition of existing standards to the invention of new frameworks. Bakhtin identifies, through his concept of chronotope, some exemplary situations which require the reformulation of schemata by the side of occupants. This paper demonstrates how these situations can be reproduced in the architectural field through the strategy of 'defamiliarization'. Defamiliarization can be induced on one hand by offering to the occupant an unexpected perspective which makes him question schemata he has adopted up to that moment. This strategy parallels the 'chronotope of the encounter' in the way it draws upon the shock of an unexpected event to deconstruct perception and make room for its reconstruction starting from the grounds of direct experience. On the other hand, defamiliarization can be based on the difficulties of perception an environment poses to the occupant. In this case, there is no clear perception to question, and the subject is challenged to draw upon his inventive faculties to discover meaning in a situation which does not exhibit any clear key of interpretation. This strategy perfectly fits the vision of affordance and ecological perception expressed by Gibson when he stated that "if what we perceived were the entities of physics and mathematics, meanings would have to be imposed on them. But if what we perceive are the entities of environmental science, their meanings can be discovered" (Gibson, 1979, p. 33).

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